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THE KINÆSTHETIC ELEMENT IN ENDOPHASIA AND AUDITORY HALLUCINATION.

(From the Psychological Laboratory of the University of
Pennsylvania.)

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Since Charcot applied the concept of three memory types, visual, auditory, and motor, to the verbal memory, many investigators have endeavored to analyze the forms in which we think, and to determine more exactly their precise nature.

Binet's wide experience leads him to conclude that all thought is either verbal or sensory. Assuming this to be true, much of our exact thought must be verbal, words being the only possible images of a great number of complex concepts. This thinking in words has been found to be accomplished in various ways by different individuals. Some see, some hear, some write and some say the words to themselves, while still others, probably the majority of persons, combine some or all of these methods.

Verbal thinking or internal language, of any type, is now generally known as endophasia, a name originally suggested by Morselli.

Charcot held that the verbal memory depended upon visual, auditory, articulatory and graphic imaging of words; these types being used independently or in various combinations by different individuals.

Some later investigators have thought the process less complex. Dejerine, for instance, while agreeing with Charcot that all these types enter into the imaging of objects, refuses to apply them all to verbal thinking, holding that the latter partakes of two and only two forms of imagery—the auditory and the articulatory. Egger goes still further and limits the process to one type, the auditory. Still later experimental investigations, however, have brought forth evidence in support of the older theory of Charcot.

Lemaitre, in 1904, published the result of his observations on ninety school children, varying in age from thirteen to fifteen years. Among these forty-five per cent. were purely motor in their verbal thought, thirteen per cent. were purely auditory

and fourteen per cent. purely visual, while the remainder variously combined the types.

G. St. Paul published in the same year the results of an extensive investigation of the subject by the questionnaire method. Two hundred and forty persons answered his questions. Thirty-eight failed to give clear information; of the remaining two hundred and two, forty-eight per cent. were auditory-motor in type, twenty per cent. were visual-motor, fifteen per cent. auditory, seven per cent. motor, nine per cent. visual and one per cent. auditory.

Both Lemaitre and St. Paul found all three types to exist, though in quite different proportions. In a large percentage of the subjects of both investigators, the articulatory images are prominent. They appear in seventy-five per cent. of St. Paul's subjects, and in forty-eight per cent. of Lemaitre's.

With such experimental evidence we seem justified in assuming that the articulatory element plays an important part in endophasia. When this articulatory element predominates, the internal language assumes the character of internal speech,—the subjects only secondarily hear or see the words, they say them to themselves.

During the process of internal speech the kinæsthetic speech centres are in a state of excitation which would lead, if uninhibited, to actual vocalization. Other brain processes, however, active at the time, inhibit the motor fulfillment either partially or entirely, the result being internal speech, accompanied or not by some slight movement of the vocal organs. The natural tendency of internal speech is toward actual vocalization, or rather internal speech is actual speech, partially inhibited.

As a rule in the healthy adult the mental content is very complex, and the accompanying brain processes equally so. There is therefore sufficient opposition from various brain centres to inhibit the motor tendency of internal speech. Occasionally, however, when a thought practically absorbs the attention, it is involuntarily given utterance. We are sometimes surprised when alone to find ourselves expressing some thought aloud. This tendency toward vocal expression is noticeable in the majority of persons when reading to themselves—there is usually a more or less pronounced movement of the lips.

It is very strong in children when they begin to read and to work out little arithmetical problems. It is sometimes almost impossible to make them read and count to themselves. This is equally true of adults whose ability to read has not progressed much further. Their lips always move in reading and usually the words are actually spoken. In such cases the mental effort

is great enough to absorb the whole attention and the uninhibited motor result is sure to follow.

With some persons the internal speech habit takes the form of soliloquy. This verbal thought is a monologue, a reverie. With others, on the contrary, it is usually conversational in character. The thoughts follow one another in dialogue form. Their minds are debating fields and new thoughts are born of contradictions. This conversational form of internal speech may again be divided into two classes. In some cases the dialogue is impersonal, both parts being equally the words and thoughts of the thinker. In other cases the second person of the dialogue is personified, and the individual imagines himself talking to some one else, and endeavors to argue as that other person would under the circumstances.

In this latter type the part of the second person is often largely auditory in character. Thinking of the words as coming from another, one would naturally associate them with the tones of that person's voice, as one's consciousness of another person's speech is, as a rule, almost entirely dependent upon auditory impressions. As our perception of our own speech is largely based upon articulatory sensations, the auditory element is not so likely to be prominent in the personal part of the dialogue.

The greater the predominance of the articulatory factor the greater is the tendency toward actual vocalization; and we find that in types like that just described, the part of the first person is much more apt to be vocalized than that of the second.

When this perfectly normal tendency to internal speech exists in the insane the usual inhibitory influence of a complex consciousness is lacking and various characteristic phenomena result. One woman who is sane enough to realize and analyze her condition to a certain extent, tells me that when she is thinking "the words come out of themselves," she has no intention of saying them and seems to have no control over them. She adds that when she is eating she "seems to be chewing words." In her case, the inhibitory control of opposing centres is greatly reduced, and verbal thought tends strongly toward vocalization. There is, however, enough inhibitory power remaining to awaken in the subject a sense of its inadequacy and of the impulse character of her speech.

Some insane conditions which are apparently dependent upon the tendency to internal speech, I shall describe as they appear in several patients at the Friends' Asylum, Frankford.

The first case illustrates the habit of internal verbal soliloquy. The patient continually carries on a low, almost inaudible talk. One might think she was conversing with some one, but, on listening, I found the talk to be as follows: "A pretty

dress, yes, yes, a pretty brown dress, yes, yes, yes, a pin, yes, yes, a bracelet, yes, yes, a chain, yes, yes, etc." This was all in description of a person at whom she was looking. I told her to talk louder, she said: "Talk louder, louder, louder, talk louder, louder, louder." Then I said, "do not talk so low," and the echo came "Do not talk so low, so low, so low, low, low."

Every perception, every thought, evidently finds expression in speech. Speech is no longer used by her as a means of communication with others, but is the involuntary result of all perceptions, all thought.

With the second patient the internal speech habit was evidently of dialogue form, and impersonal in character. This woman hears hallucinatory voices continually. Every creak of a door, tick of a clock, sigh of the wind, or twitter of a bird was laden with a message for her. Her fingers, feet and all parts of her body talked to her, as did also pictures and hallucinatory visions.

The voices were continuous, and were judged as coming from anything on which her attention was, for the moment, centered; whether this was a sound, a visible object or her own body seemed immaterial. She argued with the voices, which took up her thoughts and questioned her about them. She relates, for instance, that one day when she was wondering whether she had a spiritual body, a bird suddenly broke in with "What is a spiritual body, speak quickly, speak quickly." At times she had a dim fancy that in spite of their seeming reality, these voices might be her own thoughts, but the idea was at once stifled by the knowledge that the thoughts expressed were quite unlike hers in character.

Her type seems to be largely auditory as vocalization was rare and never occurred in the second person. The hallucinatory condition was preceded by a constant ringing in the ears, which still persists, though the patient no longer hears the voices and is rapidly regaining her normal condition.

Another patient listened intently to a conversation between several persons, without vocalizing in the least, only showing by her rapt attention and her impatient requests of those around for silence, that she was experiencing an hallucination. When it was over she explained to me what it was all about, and believed in it thoroughly. Here, then, is an example of the personal dialogue form, extended to include many personalities, while the experiencing individual plays the part of spectator and critic. As in the preceding case the type is largely auditory and the voices partake of an hallucinatory character.

The fourth case illustrates the habit of internal conversation

in which the part of the second person is personified, though not hallucinatory in character, and in which the part of the first person is predominantly motor in type. I found this patient one day, standing talking most animatedly to no one. She would apparently listen to what some one had to say and then answer at great length. On questioning, however, I found that she was only making believe that some one was there, and talking as she would if that were the case. It was simply the child's game of make believe. She evidently thought internally the responses to her talk, but she externalized only her own individual part of the conversation.

The fifth case is similar to the last, with one exception. The part of the second person, though not vocalized, is of an hallucinatory character. The patient feels sure that she hears others talking to her, she recognizes the voices as belonging to friends and relatives. She will turn suddenly away when in the midst of a conversation to answer something she alone has heard. She localizes the voices as coming from a given direction. The part of the second person in these conversations is evidently largely auditory, though not purely so, as in times of great agitation and excitement it is also occasionally vocalized.

The sixth case is illustrative of the habit of internal conversation in which both parts of the dialogue are motor in type, though the part of the second person is personified and is not so strongly motor as that of the first person. The part of the second person is, like that of the third case, hallucinatory in character.

This patient continually moves her lips and talks in a whisper. She then is apt to say "I hear" as a prelude to an unending flow of talk. If asked who says these things she stops to think and says—"It seems to be my mother," or perhaps sister, or some friend or sometimes God. She also talks much aloud when alone as though addressing these voices. The personal part in her talk is the more strongly motor in tendency, it is spoken in a loud, rich voice, while the part of the second person is merely murmured and sometimes is only betrayed by a slight movement of the lips. This second part is also probably largely auditory in type, as she localizes it in space, and never fails to sharply distinguish it from her personal thought. What a prominent part these hallucinatory voices play in her mental experience, and how clearly they are defined from what she recognizes as her own thought, is shown by the following test. I asked her to write a list of words. She writes rapidly, and in fifteen minutes had written three hundred and thirty words in sentence form, prefixing to each sheet the words "I hear." I then asked her not to write what

she heard, but to write me a list of words which she thought of herself. In the same length of time she wrote forty-one words. She made a visible effort to think of words and would sometimes start one, then pause, saying, "No, I heard that," think a moment, and finish out the word in some other way.

The seventh case is again the result of personified internal dialogue. The old lady sits day after day talking to her sons and daughters, her grand-children and all those whom she has loved in the past. She always answers herself and is sure they are somewhere near, though she does not see them, for "they must be" when she "hears them talk." She thought me quite ridiculous for asking whether they were here. "Of course they are, don't you hear them?" said she. Both parts of the conversation in this case are strongly articulatory in type.

The eighth and last case is also illustrative of the habit of personified internal dialogue, in which both parts are equally motor in character. This case which drew my attention to the character of the whole group, is that of a woman who is harassed continually by "people talking to her." I could hold her attention no longer than a few seconds, when she would turn excitedly away to answer some imaginary voice. "Do make them stop, so that I can talk to you. Do make them stop, they frighten me so. They say such dreadful things. Did you hear that? They are going to murder me," etc. Her speech was so badly affected that it was difficult at first to follow her talk, but I soon found that all she hears she said herself. She would say something, and then answer in a different tone of voice and with very different emotional expression. She would almost weep in her own character and the next instant break out in some angry threat. In this case the motor tendency predominates in both the personal and the hallucinatory portion of the conversation. The voices are not localized at some distance from the patient, as they were in the three preceding cases, when the auditory characteristics were strong, but in her head or mouth. She says that these people, whom she names, use her mind and sometimes her voice, and that she cannot stop them and they drive her frantic.

These eight cases seem to me to illustrate the different varieties of internal speech, isolated, undisguised, and uninhibited, as they never appear in a normal mind. The first case is one of internal soliloquy. The second is one of impersonal external dialogue, in which the auditory element is quite strong, and in which the part of the second person is hallucinatory in character. The third is one of personified internal dialogue, in which, also, the auditory element is strong and the part of the second person is of hallucinatory character. The fourth is one of personified internal dialogue, in which the stronger

motor tendency is in the part of the first person. The fifth differs from the fourth only in that the second person is hallucinatory in character. The sixth is similar in form, the motor tendency being strong in both parts of the dialogue, though predominantly so in the part of the first person. The seventh and eighth cases are both examples of personified internal dialogue in which the part of the second person is hallucinatory, and equally motor in type with the part of the first person. In the seventh case, however, it is probable that the auditory element is strong in the part of the second person, while in the eighth case it is weak or altogether lacking.

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